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EXAMINER
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SURVILLO, OLEG

ART UNIT	PAPER NUMBER
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2142

MAIL DATE	DELIVERY MODE
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08/14/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/816,358

Applicant(s)

JUNG ET AL.

Examiner

Oleg Survillo

Art Unit

2142

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :03/31/04, 04/22/04, 04/18/05, 07/24/06, 01/12/07, 03/08/07, 04/02/07, 04/16/07, 05/07/07, 06/08/07, 06/25/07, 07/09/07, 07/19/07 .

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because it does not enable the United States Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. Correction is required. See MPEP § 608.01(b).

4. The application contains disclosure entirely outside the bounds of the allowed claims. Applicant is required to modify the brief summary of the invention and restrict the descriptive matter so as to be in harmony with the claims (MPEP § 1302.01). In particular, it appears that only disclosure of section II. AGGREGATING MOTE-ASSOCIATED INDEX DATA (pages 14-18 of the specification) and partially the disclosure of section I. MOTE-ASSOCIATED INDEX CREATION (pages pertaining to the description of Fig. 2 and Fig. 4) is relevant to the subject matter claimed in claims 1-39. The rest of the specification (pages 12-38 and partially pages 6-11) describes the subject matter of the co-pending applications wherein the name of each section in the specification corresponds to the name of each of the co-pending applications. Applicants are reminded that the subject matter of the later sections of the specification (sections I, II, IV, and V.) is actually included through their incorporation by reference of the related/parent applications, as mentioned in the beginning of the specification (pages 1-4). As a result, providing a detailed description of the subject matter of co-pending applications is redundant and must be removed from the current application.

***Claim Objections***

5. Claim 7 is objected to because of the following informalities: the body of the claims appears to be missing "more" in "...from one or notes to be included in the listing". Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 17-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As to claim 17, multi-mode index creation agent appears to be a computer program (specification, page 15, lines 9-12) (for the interpretation of means plus function language please refer to ***Claim Rejections - 35 USC § 112*** section of the Office Action). A system comprising a computer program per se is not in one of the statutory categories.

As to claims 18-32, additional means for performing a function do not appear to introduce any tangible elements that would render a system of claim 17 statutory under 35 U.S.C. 101.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 2142

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 17-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Claims 17-32 incorporate means-plus-function limitations reciting a function to be performed rather than definite structure or materials for performing that function.

As to claim 17, limitation: "means for aggregating" is interpreted to invoke 35 USC 112, sixth paragraph.

The current specification shows that aggregating at least a part of one or more mote-addressed content indexes from a first set of motes is performed by a multi-mote index creation agent (502) (specification, page 17 lines 2-5). Therefore, means for aggregating are interpreted to be a multi-mote index creation agent (502).

Claim 17 appears to be a single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, and is, therefore, subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. *In re Hyatt*, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983)

***MPEP 2164.08(a)***

Claims 18-32 are rejected under 35 U.S.C. 112, first paragraph as being dependent from the claim 17.

Art Unit: 2142

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 16, 32, 33, 34, and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 16 and 32, it is ambiguous because it is unclear if a multi-mote index creation agent is the same element as a multi-mote index creation unit. If it is the same element, consistent naming must be used to avoid ambiguity. If it is a different element, then the multi-mote index creation unit is lacking antecedent basis.

As to claim 33, it is ambiguous because it is unclear what is being meant by "proximate to a portion of said mote". Appropriate correction or explanation is required.

As to claim 34, "...configured to index at least a part of at least one mote-addressed content index" is ambiguous because it is not clear what is being meant by indexing the index.

As to claim 36, it is ambiguous because it is unclear how a multi-mote index creation agent, which is a software program, comprises a processor, which appears to be a hardware component.

### ***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –



Art Unit: 2142

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-4, 7, 8, 10, 11, 13, 17-20, 23, 24, 26, 27, 29, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Mulgund et al. (2002/0161751).

As to claim 1, Mulgund shows:

aggregating at least a part of one or more mote-addressed content indexes from a first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4), wherein the terms "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 2, Mulgund shows:

receiving at least a part of one or more mote-addressed indexes of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062)).

As to claim 3, Mulgund shows:

creating one or more multi-mote content indexes of the first set of motes (Fig. 4, paragraph [0042]).

As to claim 4, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

As to claim 7, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from one or more motes to be included in the listing (paragraph [0061] and [0062]) wherein the second column in table 1 (CAL) shows the current links from the Node being visited.

As to claim 8, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062)) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 10, Mulgund shows:

receiving at least a part of one or more multi-mote content indexes of the first set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 11, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062)) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 13, Mulgund shows:

Art Unit: 2142

creating an aggregate of at least a part of one or more multi-mote content indexes of the first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

As to claims 17-20, 23, 24, 26, 27, 29, Mulgund shows all the elements, similar to corresponding claims 1-4, 7, 8, 10, 11, 13.

As to claim 33, Mulgund shows:

a mote (Fig. 1 node (2)); and

means for aggregating at least a part of one or more mote-addressed content indexes from a first set of motes [sensor network modeling agent (14), Fig. 2), said means for aggregating proximate to said mote (paragraph [0044]).

### ***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 5, 6, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (2002/0161751) in view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claim 5, Mulgund shows:

Art Unit: 2142

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from a multi-mote registry [Nodes Table (20)].

Alternatively, Chiloyan shows:

obtaining a listing of devices from a registry [having an operational system accessing device registry to check if the particular peripheral device model is included in the current device registry] (col. 1 lines 50-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by obtaining a list of devices from a registry in order to check if the particular device model and necessary information about the device is in the registry (col. 1 lines 58-63 in Chiloyan).

As to claim 6, Mulgund shows:

obtaining a pre-loaded listing of motes [initial model construction listing] (paragraph [0046]) appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

Alternatively, Chiloyan shows:

obtaining a pre-loaded listing of devices [devices already included in the current device registry] (col. 1 lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by obtaining a pre-loaded list of devices in order to check if the particular device model and necessary information about the device is already included in the registry (col. 1 lines 58-63 in Chiloyan).

As to claims 21 and 22, Mulgund in view of Chiloyan show all the elements, similar to corresponding claims 5 and 6.

15. Claims 9, 12, 14, 15, 25, 28, 30, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (2002/0161751) in view of Kung et al. (2005/0021724).

As to claim 9, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062)] wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes

Art Unit: 2142

since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 12, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claims 14 and 15, Mulgund shows:

aggregating at least a part of a mote-addressed index of a multi-mote content index (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Mulgund does not show that a mote-addressed index is a routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a mote-addressed routing/spatial index being aggregated in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

Alternatively to Kung, Madden (reference used in rejection of claim 16) shows a mote-addressed routing/spatial index at a mote (under 2.2 communication in sensor networks, paragraph 2).

As to claims 25, 28, 30, 31, Mulgund in view of Kung shows all the elements similar to corresponding claims 9, 12, 14, 15.

16. Claims 16, 32, and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (2002/0161751) in view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al.

As to claim 16, Mulgund shows:

migrating to a mote of the first set of motes [visiting a first sensor node] (paragraph [0007] lines 18-19, paragraph [0062]); and

Art Unit: 2142

receiving at least a part of one or more mote-addressed content indexes with the multi-mote index creation agent [interrogating a node with a network modeling agent retrieving the information stored at the node (paragraph [0044])].

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base. However, the management module per se is not explicitly shown.

Madden shows installing a multi-mote index creation agent at the mote comprising a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by installing a multi-mote index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 32, Mulgund in view of Madden shows all the elements similar to claim 16.

As to claim 34, Mulgund shows

at least one mote (Fig. 1 node (2)); and

at least one multi-mote index creation agent [sensor network modeling agent (14), Fig. 2), said at least one multi-mote index creation agent configured to index at least a part of at least one mote-addressed content index (Fig. 3 and paragraph [0037]).



Art Unit: 2142

Mulgund also shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some agent resident in a mote that collects data from sensors and stores it in the local knowledge base, however, the local agent per se is not explicitly shown.

Madden shows a multi-mote index creation agent resident in a mote comprising a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a multi-mote index creation agent resident in the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 35, Mulgund in view of Madden shows:

at least one of a sensing function, a control function, or a routing/spatial information of the mote-appropriate device (paragraphs [0037], [0041] in Mulgund) and (under 2.2 Communication in Sensor Networks, paragraph 2 in Madden).

Claim 36 will be examined as best understood.

As to claim 36, Mulgund in view of Madden shows:

a processor configured to obtain at least a sensing function of the mote (section 2.1 Properties of Sensor Devices, paragraph 2 in Madden).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Mulgund by having a processor in order to process sensor data that is being stored in a knowledge base (Fig. 2 in Mulgund).

As to claim 37, Mulgund shows at least one of a processor, a memory, or a communications devices formed from a substrate (paragraph [0026]).

As to claim 38, Mulgund shows:

at least one mote (node (2) in Fig. 1); and

at least one multi-mote registry [Nodes Table (20)], said at least one multi-mote registry having one or more indicators of one or more motes to be indexed (paragraphs [0037], [0061] and [0063], second column (CAL) in table 1).

Mulgund does not show that at least one multi-mote registry is resident in said at least one mote.

Madden shows a multi-mote registry [a short list] resident in a mote (under 2.2 Communication in Sensor Networks, paragraph 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a multi-mote registry being resident in the mote in order to keep a list of neighbors who they have heard transmit recently, as well as some routing information about the connectivity of those neighbors (under 2.2 Communication in Sensor Networks, paragraph 2) (similar to information about child nodes in Mulgund, Table 1, second column).

As to claim 39, Mulgund shows that one or more indicators of one or more motes to be indexed comprise one or more mote-network addresses (paragraph [0037]).


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Oleg Survillo whose telephone number is 571-272-9691. The examiner can normally be reached on M-Th 7:30am - 5:00pm; F 7:30am - 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on 571-272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Oleg Survillo  
Phone: 571-272-9691

  
ANDREW CALDWELL  
SUPERVISORY PATENT EXAMINER